

428 40 141

5324566

FIG. 1

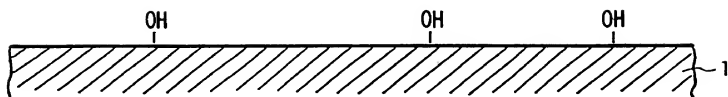


FIG. 2

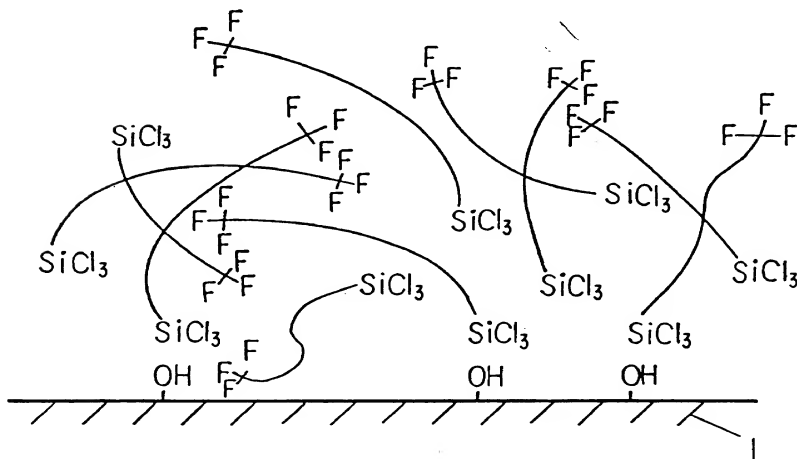


FIG. 3

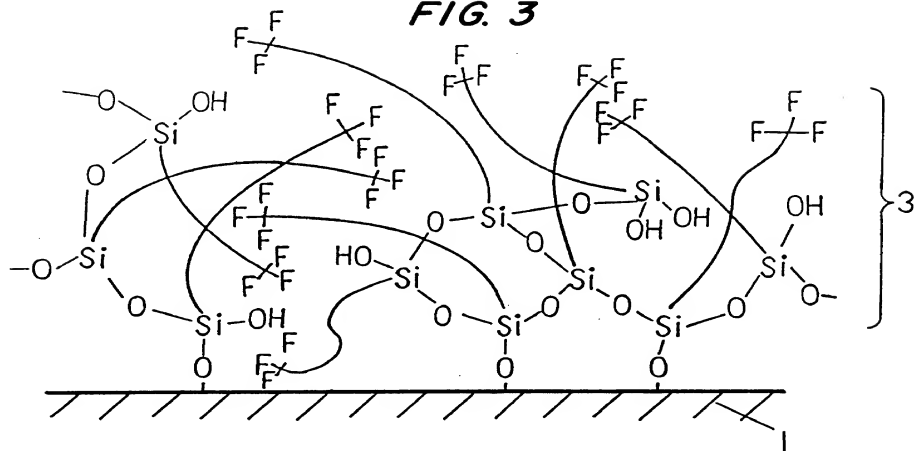


FIG. 4

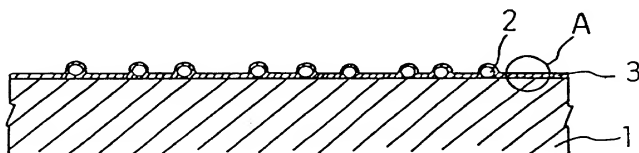


FIG. 5

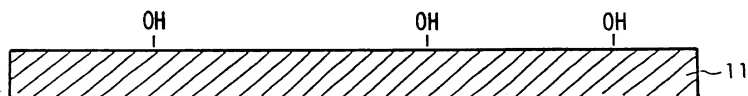


FIG. 6

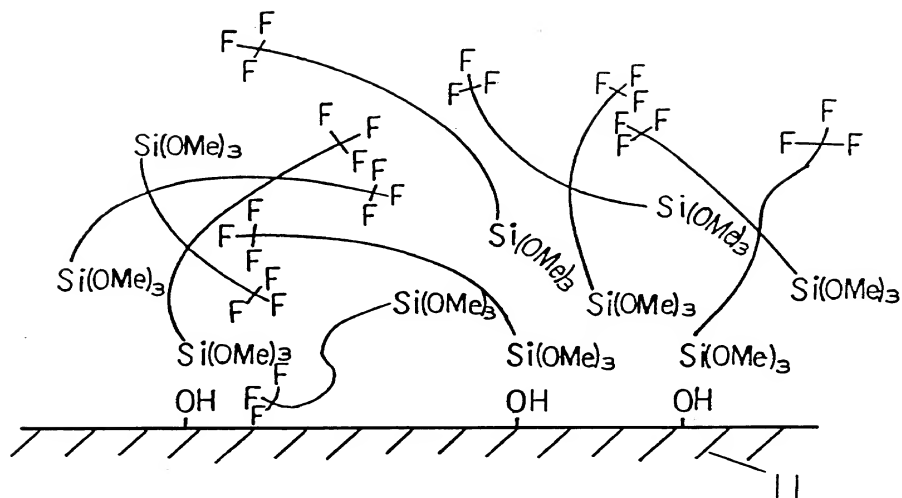


FIG. 7

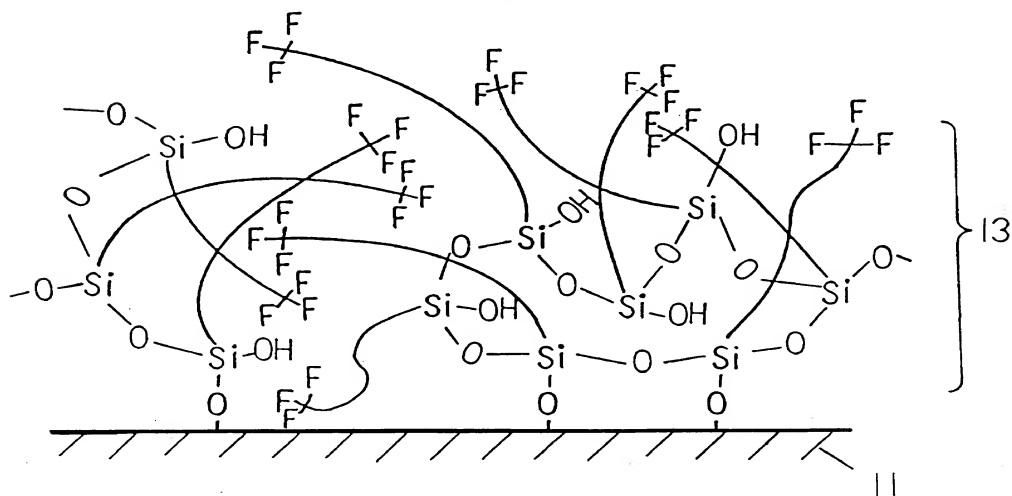


FIG. 8

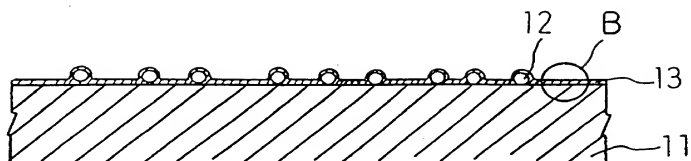


FIG. 9

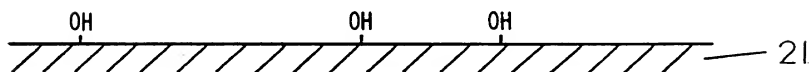


FIG. 10

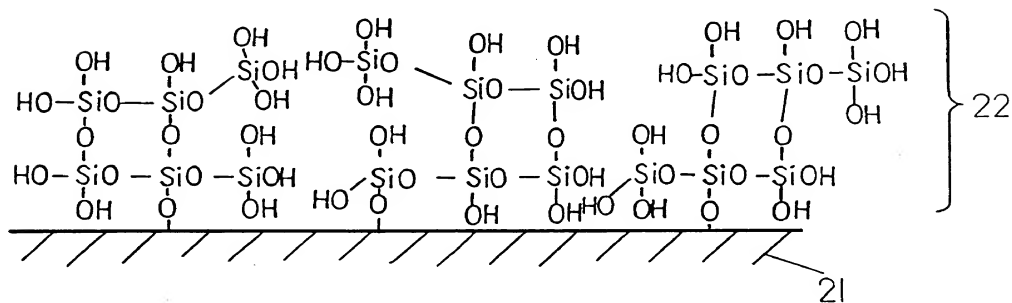


FIG. 11

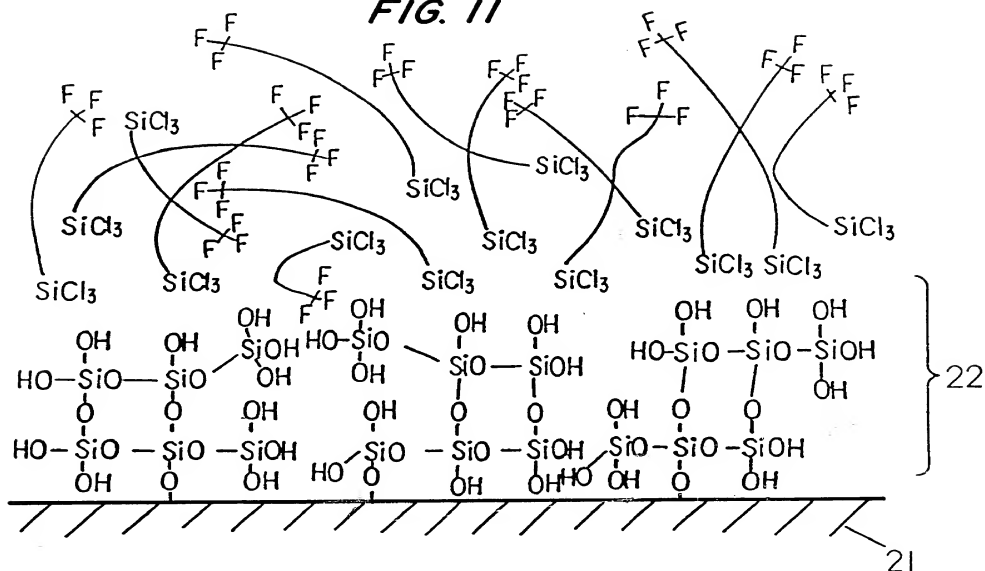


FIG. 12

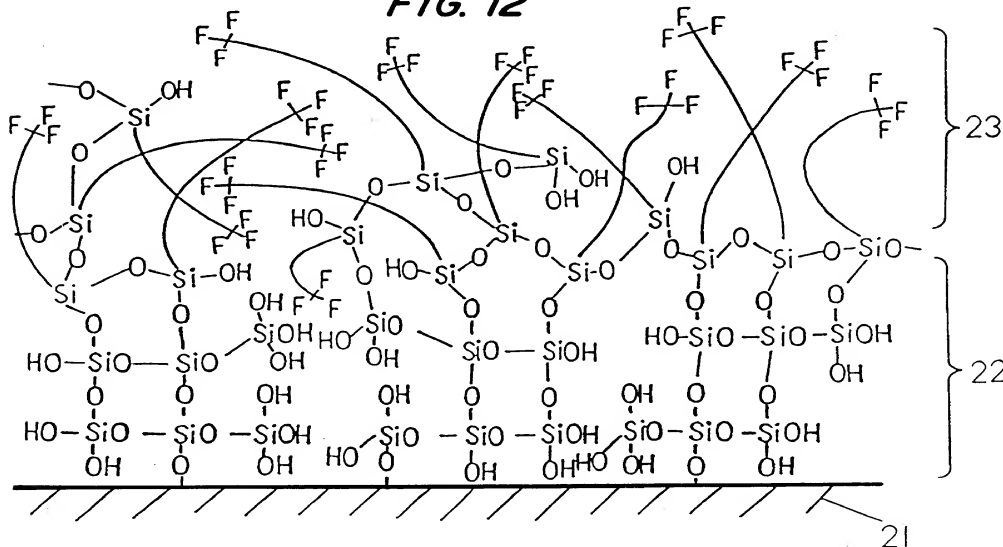


FIG. 13

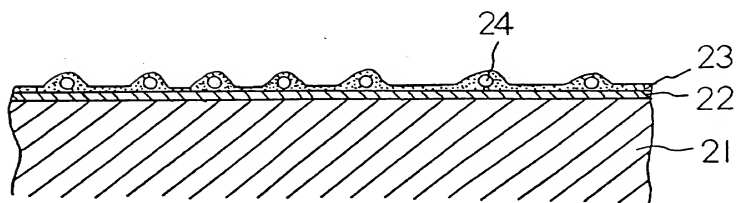


FIG. 14

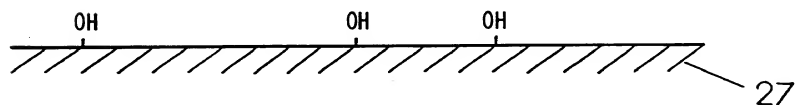


FIG. 15

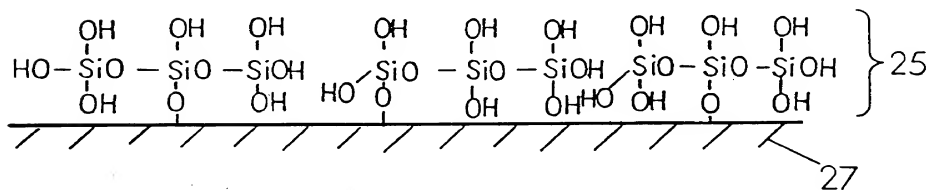


FIG. 16

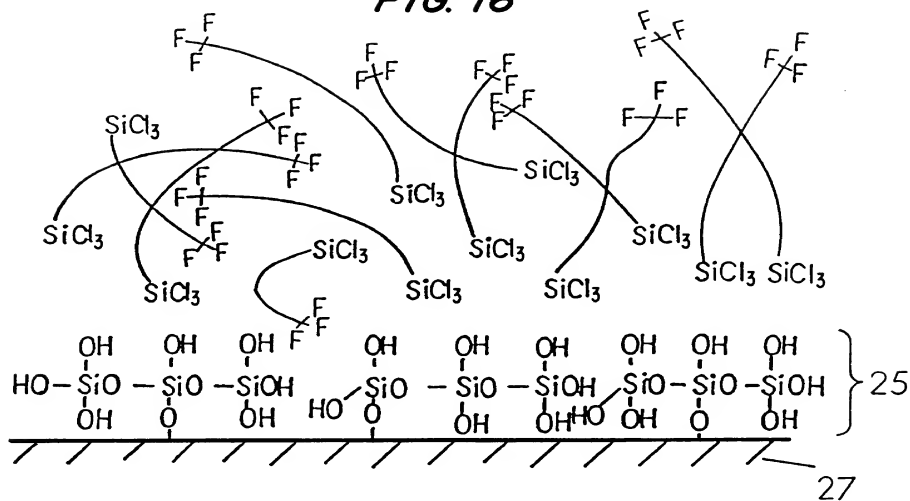


FIG. 17

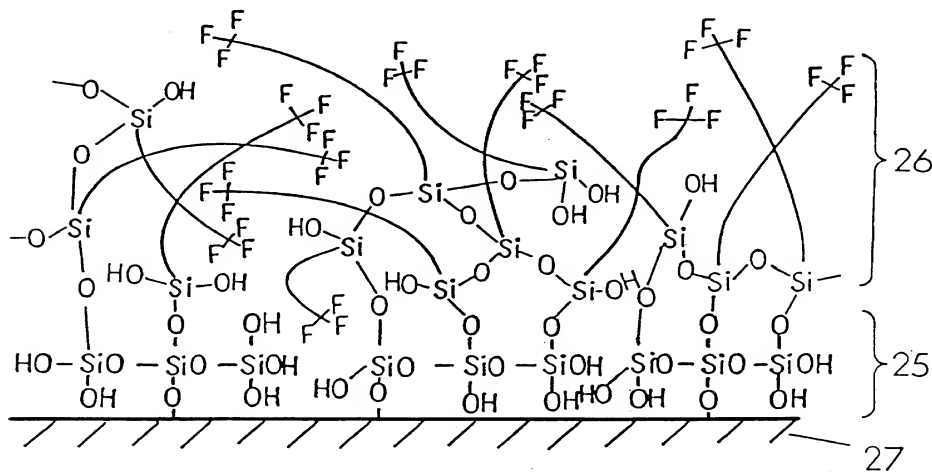


FIG. 18

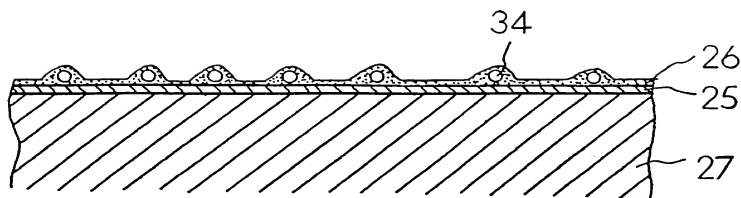


FIG. 19

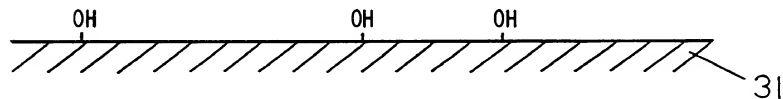


FIG. 20

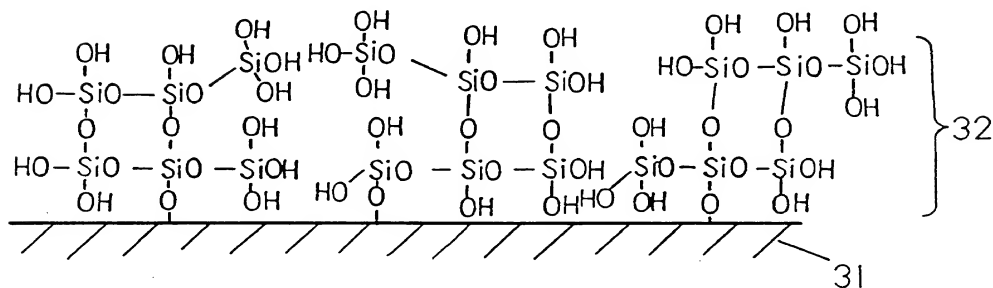


FIG. 21

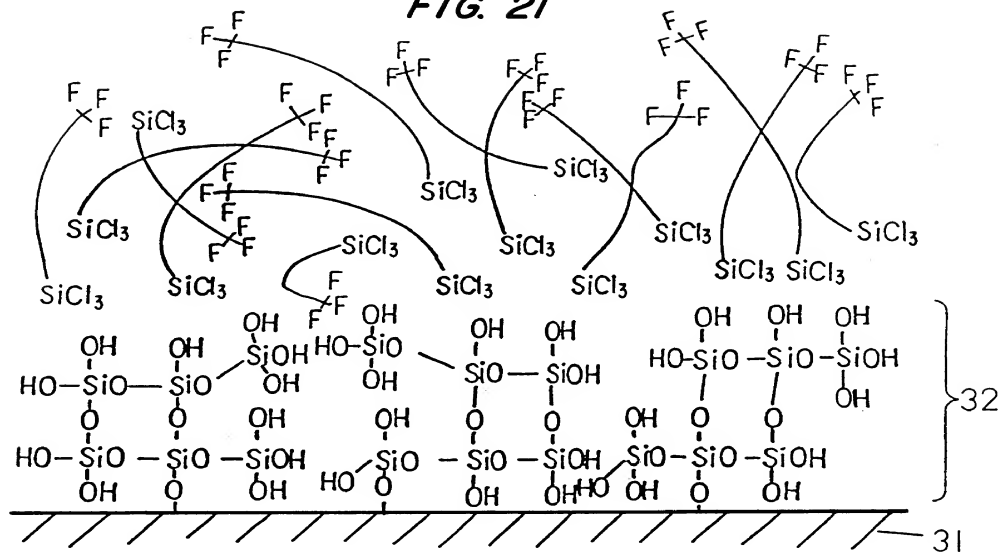


FIG. 22

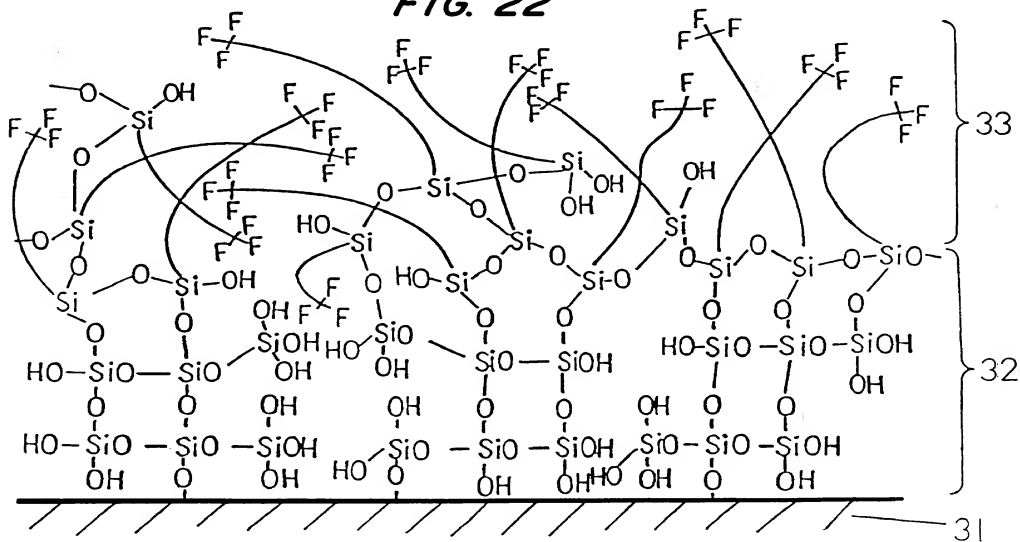


FIG. 23

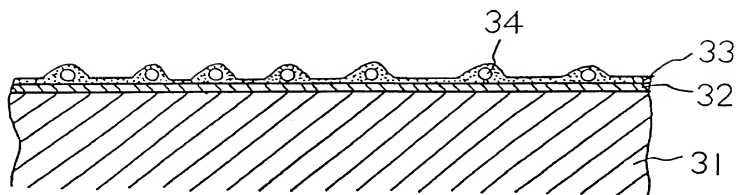


FIG. 24

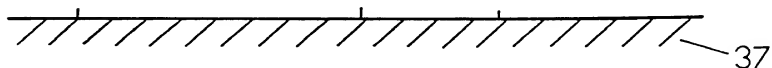


FIG. 25

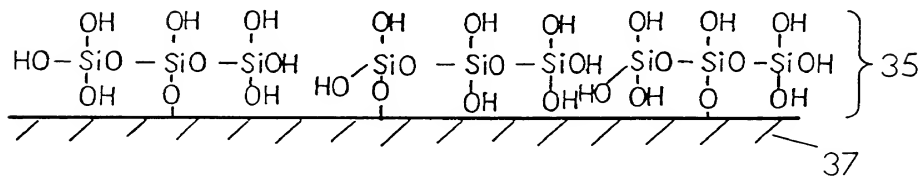


FIG. 26

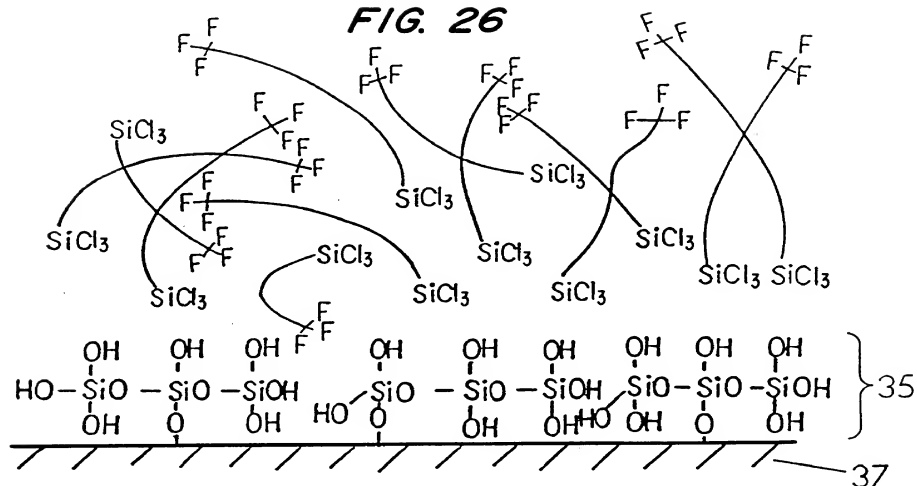
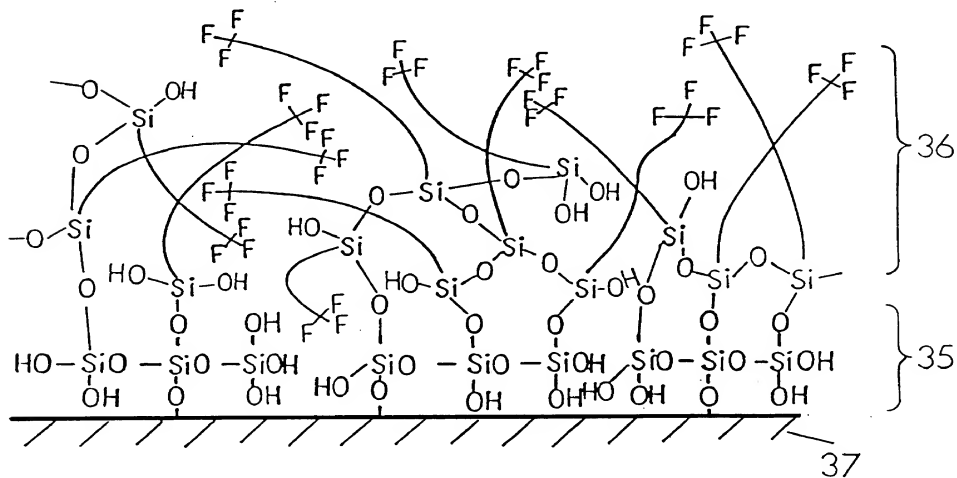


FIG. 27



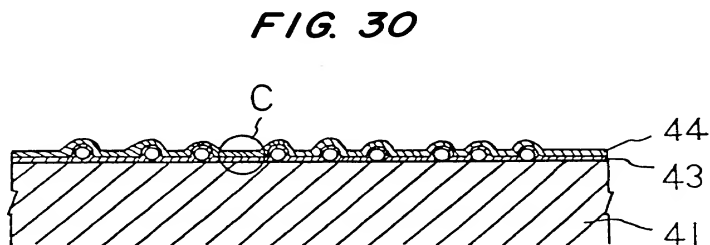
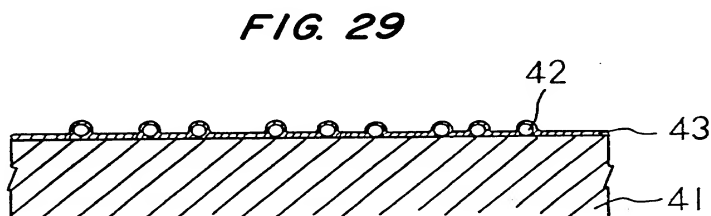
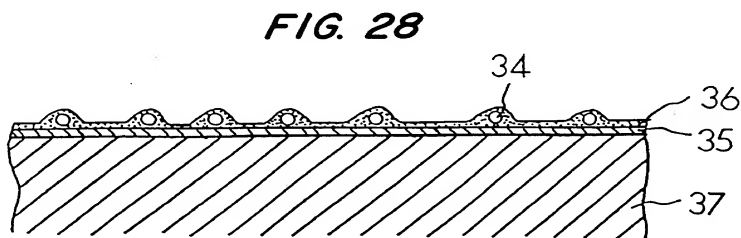


FIG. 31

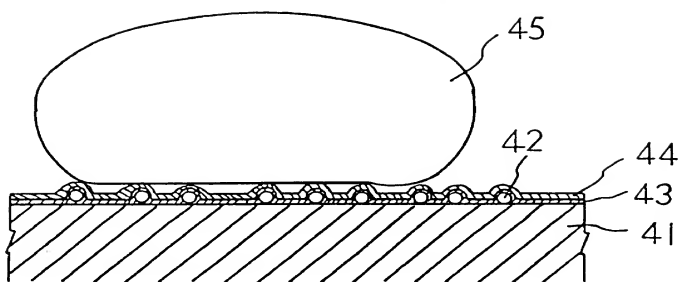


FIG. 32

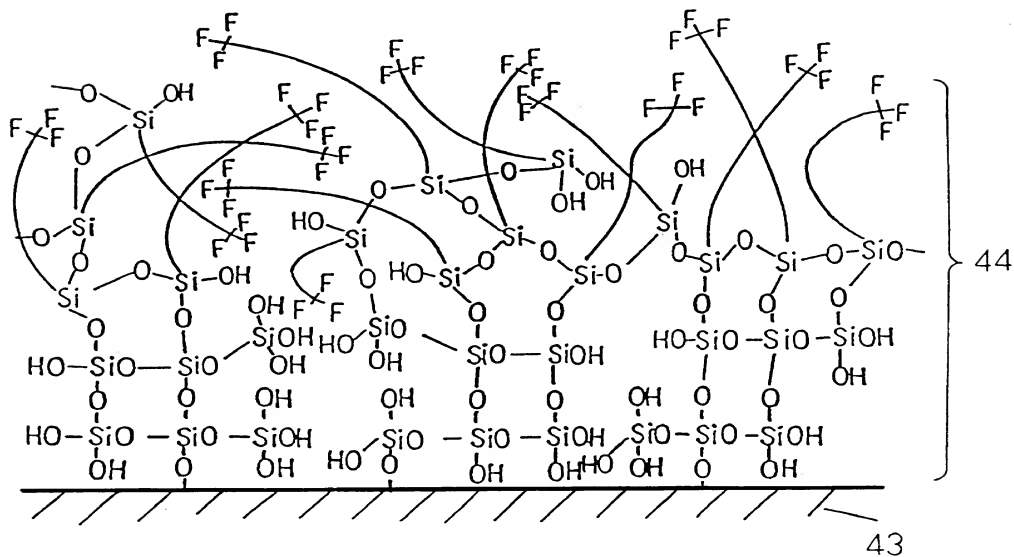


Diagram illustrating the chemical structure of a fluoropolymer-silica composite. The structure shows a repeating unit of a fluoropolymer chain (F-C-F) connected via a zigzag line to a silicon atom (SiO). This silicon atom is part of a silica network (SiO-SiO) with hydroxyl groups (OH) attached. The entire structure is labeled with a bracketed '48' on the right. Below this, another bracketed '47' indicates a specific repeating unit of the silica network. At the bottom, a hatched area represents the substrate, labeled '46'.

A cross-sectional view of a substrate assembly. A hatched substrate 51 is shown with a thin top layer 53. A series of solder balls 52 are attached to the top surface of the substrate.

FIG. 36

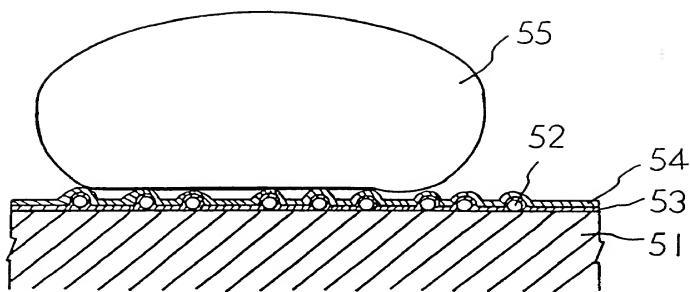


FIG. 37

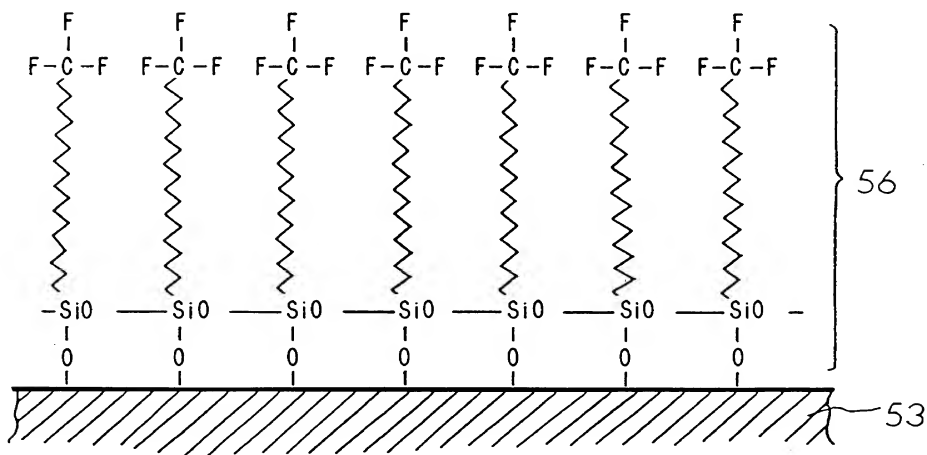


FIG. 38

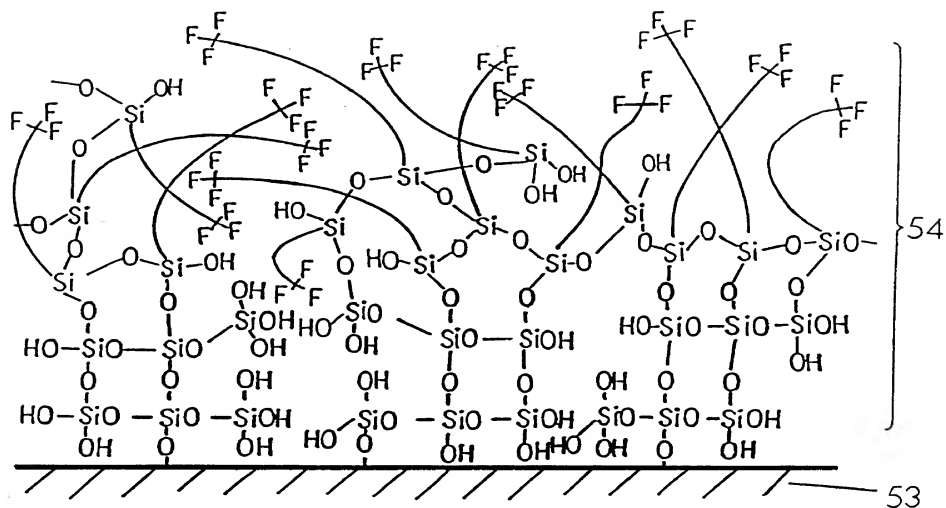
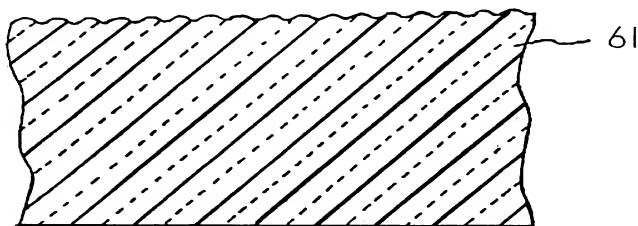


FIG. 39



428 141

FIG. 40

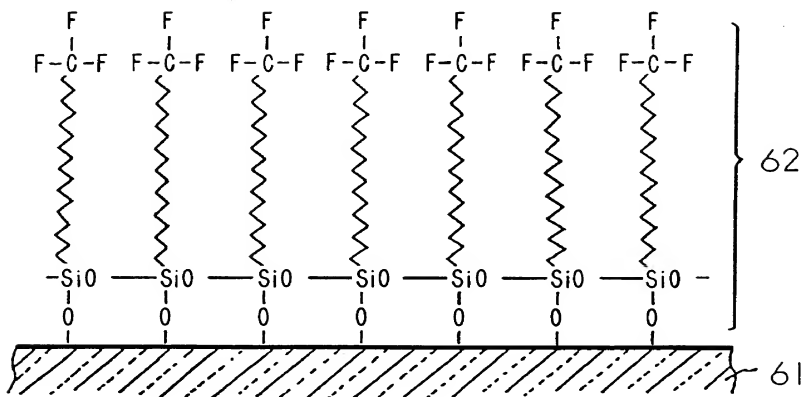


FIG. 41

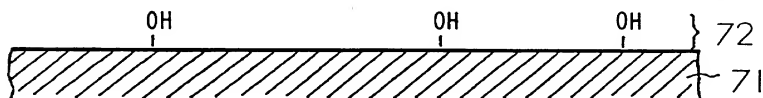


FIG. 42

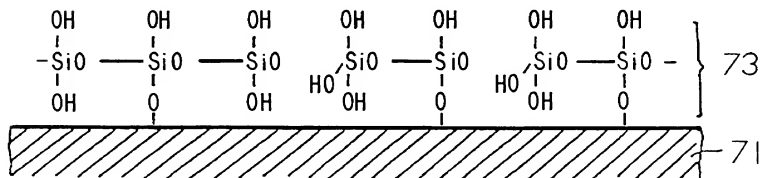


FIG. 43

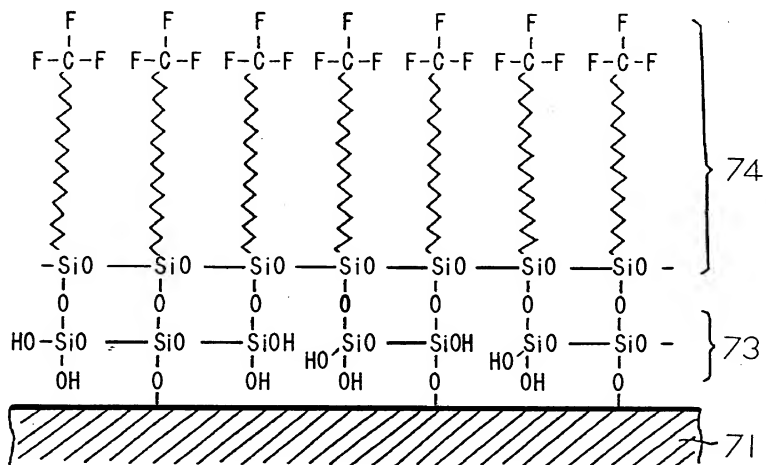


FIG. 44

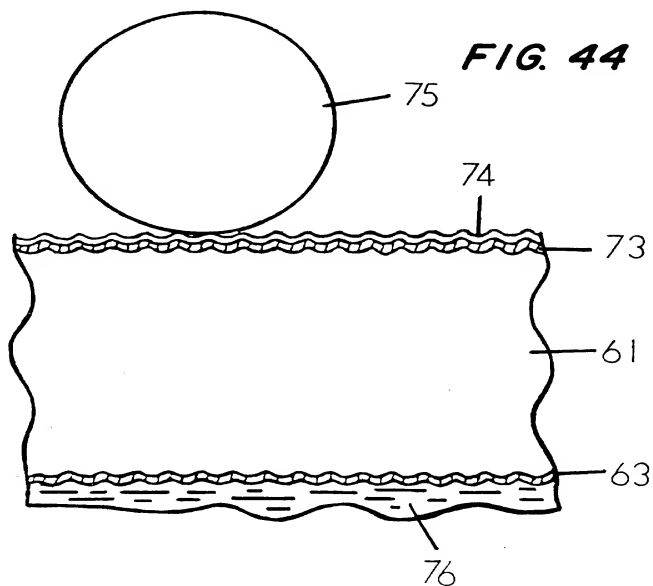


FIG. 45(a)

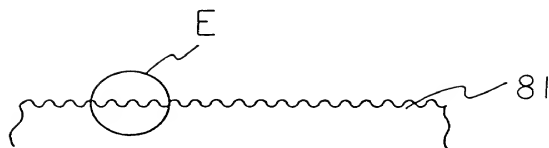
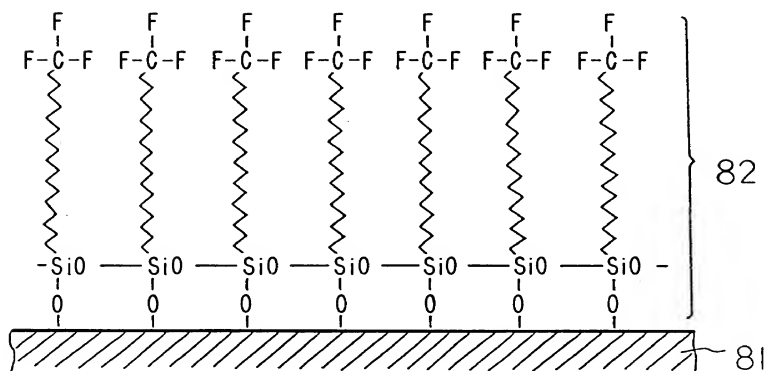


FIG. 45(b)



A cross-sectional view of a substrate 91, indicated by a hatched pattern. A thin surface layer 92 is positioned on top of the substrate. Three hydroxyl groups, labeled 'OH', are shown on the surface of layer 92. A bracket on the right side of the diagram groups the surface layer 92 and the substrate 91 together.

$$\begin{array}{ccccccccccc} \text{OH} & & \text{OH} & & \text{OH} & & \text{OH} & & \text{OH} & & \text{OH} & & \text{OH} \\ | & & | & & | & & | & & | & & | & & | \\ \text{HO}-\text{SiO} & - & \text{SiO} & - & \text{SiOH} & & \text{HO}-\text{SiO} & - & \text{SiOH} & & \text{HO}-\text{SiO} & - & \text{SiO}- \\ | & & | & & | & & | & & | & & | & & | \\ \text{OH} & & \text{O} & & \text{OH} & & \text{OH} & & \text{O} & & \text{OH} & & \text{O} \end{array} \quad \left. \vphantom{\begin{array}{ccccccccccc} \text{OH} & & \text{OH} & & \text{OH} & & \text{OH} & & \text{OH} & & \text{OH} & & \text{OH} \end{array}} \right\} 93$$

Diagram illustrating the chemical structure of a fluorinated silane monolayer on a substrate (91). The structure consists of a repeating unit of a fluorinated silane (92) linked to a siloxane network (93). The fluorinated silane unit (92) is represented by a vertical chain of fluorine atoms (F) connected by zigzag lines, with a central carbon atom (C) bonded to two fluorine atoms (F-C-F). The siloxane network (93) is represented by a horizontal chain of silicon atoms (Si) connected by oxygen atoms (O), with a central silicon atom (Si) bonded to two oxygen atoms (Si-O-Si). The fluorinated silane unit (92) is linked to the siloxane network (93) via a silicon atom (Si) bonded to an oxygen atom (O), which is further bonded to a fluorine atom (F). The entire structure is labeled 94.